

INFECTIOUS DISEASE

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Problems of diagnostics, treatment and prevention of multiple hydatid echinococcosis of the liver*D. Sh. Sapaev, R. Yu. Ruzibaev, B. N. Kuryazov, F. R. Yakubov*Urgench branch of Tashkent Medical Academy, Ministry of Health of Uzbekistan,
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Optimization of the diagnostics, increase of echinococcosis treatment quality and methods of prevention. Experience in echinococcosis surgical treatment based on material obtained from 231 patients treated in hospitals of the Khorezm region of the Republic of Uzbekistan is presented. Single cysts were diagnosed in 165 (71.4%) cases, multiple — for 66 (28.6%) ones. Immunoassay complex of instrumental examination for serological tests was used in enzyme detection. Patients operated for multiple and combined echinococcosis constituted 84 persons with total cysts number 251. Various radical resections of liver were performed: closed echinococcectomy performed constituted 114, including 21 partial pericystectomy; semi-closed echinococcectomy — 9, including 3 partial pericystectomy; ideal echinococcectomy was performed in four cases. Chemical treatment of residual cavity was used, as well as physical treatment methods (ultrasonic cavitation + decasan). In the postoperative period, prophylactic chemotherapy was carried out (Zentel, 12 mg per kilogram of weight). Thorough comprehensive diagnostics is required for combined and multiple echinococcosis detection, including both immunodiagnostics (IgG) and instrumental examination (ultrasound scan, MSCT, or MRI, X-rays).

Keywords: multiple and combined echinococcosis, diagnostics and surgical treatment methods including prevention.

Introduction

Echinococcosis is a complex chronic disease with extremely wide distribution area [1]. According to World Health Organization (WHO) definition, echinococcosis is a disease with endemic localization foci in all countries of the world [2]. Clinical manifestations ranges from asymptomatic to severe, sometimes even fatal [3; 4].

When a large number of oncospheres simultaneously enters the body, multiple invasion may arise in several organs. The development of parasitic cysts in more than one organ is called the “combined” forms of echinococcosis. The name “disseminated” echinococcosis used by some authors in these cases includes, above all, secondary forms of multiple echinococcosis. Primary cysts are more often located in two organs (or more) in various combinations: simultaneously — in the liver and lung, in both lungs, in the liver and spleen, etc. [5]. Diagnostics of echinococcosis sometimes is a result of a random finding using ultrasound analysis. Available clinical symptoms depend on size, number and location of cysts, presence and nature of complications [6; 7].

Disseminated echinococcosis is the most severe form of pathology, diagnostics and treatment of which presents significant difficulties because patients are often operated based on urgent indications and nature of the pathology and multiplicity of damages appeared as unexpected finding in course of abdominal cavity abdominoscopy; therefore, performed operations may be not radical [8; 9; 10]. Cyst breakthrough in abdominal and pleural cavities may result in secondary invasion (dissemination) of echinococcus [11].

The main causes of relapse and dissemination of the disease are non-radical nature of the primary operation, violation of surgical technique, failure to comply with principles of parasites elimination in course of operation, insufficient equipment at medical institutions, insufficient qualification of surgeons, ignoring anti-relapse and preventive chemotherapy in the pre- and postoperative periods [12].

Cyst breakthrough in abdominal cavity is one of the leading factors in postoperative relapse development [13].

According to B. V. Petrovsky (1985), combined lesions of echinococcosis occurred in 4 % of patients; V. V. Vakhidov and E. S. Islambekov (1972) reported that combined lesions occur in 10 % of cases; according to other authors, in 9–18 % of cases, recently it reached 24 % [14].

Diagnostics of combined lesions of the lungs, liver, and other organs is difficult but practically important, because accurate diagnostics permits to determine the treatment tactics, to select rational operational access and extent of forthcoming operation [15; 16; 17; 18].

Utilization of highly sensitive diagnostics methods (ultrasound sonography (USS), multislice computed tomography (MSCT), magnetic resonance imaging (MRI)) in clinical practice allows scientists to develop new and improve existing treatment methods and apply them in treatment of multiple and combined liver echinococcosis [19].

Currently four different types of uncomplicated abdominal echinococcosis treatment are used: surgical, transcutaneous aspiration-puncture, chemotherapy for active cysts, and expectant method for inactive cysts. Patients distribution by these types should account stage, size and location of cyst, as well as the presence of concomitant diseases and available clinical expertise [20]. However, clinical decision algorithms, treatment efficacy, recurrence rate, and costs associated with diagnosis and treatment still constitute a problem [21]. Currently, minimally invasive methods of surgical treatment of liver echinococcosis, such as percutaneous aspiration echinococectomy, echinococectomy made using mini-access, laparoscopic echinococectomy, are being introduced. But these surgical methods can not be used in the treatment of multiple and combined echinococcosis.

Chemotherapy is also used to treat pathology. The use of albendazole to prevent recurrent echinococcosis is recommended by all authors, but there is no consensus regard-

ing the duration of treatment. The minimum duration of treatment recommended by most authors is three months [22].

Thus, despite the active search and new surgical treatment methods development of patients with combined and multiple echinococcosis as well as improvement of the operating technique, many unsolved problems remain.

Materials and methods

From 2010 to 2017, 231 patients underwent surgical treatment of liver echinococcosis, including 184 (79.6 %) patients with primary and 47 (20.4 %) patients with recurrent echinococcosis. Age of the patients ranged from 18 to 77 years. Most of the patients were in active working age. There were 111 men (48.1 %) and 120 women (51.9 %). Single cysts were found in 125 (54.1 %) cases, multiple — in 106 (45.9 %). Table 1 shows the nature of the lesion in multiple and combined echinococcosis.

Table 1. Nature of lesion in multiple and combined echinococcosis

Localization of echinococcosis	The number of patients and cysts			
	Patients	Recurrent	Echinococcus Cyst	Total
Liver	59	13	146	146
Liver + lungs	1	—	1+1	2
Liver no + spleen	5	1	8+5	13
Liver + Gland	9	3	13+12	25
Liver + small pelvis	6	2	7+8	15
Liver + diaphragm + spleen + omentum + pelvis + retroperitoneal space	2	1	3+2+2+7+4+2	20
Liver + diaphragm + spleen + lateral canal + mesenteric part of intestine + small pelvis	1	1	1+1+1+1+1+1	6
Liver + spleen + epiploon + mesenteric part of intestine + small pelvis	1	1	4+1+6+11+2	24
Total	84	22	251	251

Enzyme-linked immunosorbent assay (IgG) and complex instrumental examination (ultrasound scan, but MSCT, MRI, x-ray) were used for diagnostics.

84 patients (251 cysts) were operated with multiple and combined echinococcosis, including 22 (26 %) patients with recurrent echinococcosis and 20 (23.8 %) patients with complicated echinococcosis. 69.9 % of cysts were detected in the right lobe of liver, in the left lobe in 26.7 % of cases, the central localization was found in 3.4 % of cases. Complicated echinococcosis was found in 16 (27.1 %) patients (24 cysts). The following complications of echinococcosis were observed: cyst suppuration — 7 (11.9 %), biliary fistula — 9 (15.2 %).

Combined echinococcosis of the liver and other abdominal organs was observed in 25 patients (105 cysts). Hepatic cyst localization was observed in 35.2 % of cases, in spleen — in 8.6 % of cases, in the omentum — in 23.8 % of cases, in the mesentery of the intestine — in 11.4 % of cases, in the small pelvis — in 14.2 % of cases, in diaphragm —

2.9 % of cases, in retroperitoneal space — 2.9 % of cases and in lungs — 1 % of cases. Complicated echinococcosis was observed in 4 patients (5 cysts). The following complications of echinococcosis were observed: cyst suppuration in 1 patient, biliary fistula in 1 patient, breakthrough into the abdominal cavity in one case, calcification in 1 patient.

Results and discussion

We have found that only complex use of enzyme immunoassay ensures the accuracy of diagnosis up to 95 % with specificity 89 %. UZS confidence reaches 86 %, MSCT — 89 %, MRI — 94 %.

59 patients (146 cysts) with multiple liver echinococcosis were operated. Various radical liver resections were performed, including 114 patients with closed echinococcectomy, 21 patients with partial pericystectomy; 9 patients with semi-closed echinococcectomy, for 3 patients partial pericystectomy was performed; ideal echinococcectomy was performed in four cases. 105 cysts of the abdominal cavity were removed, including five cases when splenectomy was performed together with echinococcal cyst. In one case simultaneous echinococcectomy was made from the liver and lungs.

Looking the ways to improve surgical treatment of echinococcosis and effective methods of interoperative disease recurrence prevention inevitably leads to the need to revise the principles with antiparasitic nature of echinococcosis surgery [23]. To comply with these principles, we performs the following activities: 1) thorough separation of the surgical field and surrounding tissues; 2) minimal trauma to the cyst during revision of the affected organ and cyst discharge; 3) removal of the contents of cysts, preventing the ingress of hydatid fluid on the surrounding tissues and surgical underwear; 4) thorough revision of residual cavities, complete removal of the germinal elements and cuticular membrane, which is possible only with the choice of rational operational access; 5) expansion of indications for the use of such surgical methods that exclude the possibility of opening the cyst cavity (“ideal echinococcectomy”, resection of a part of the affected organ together with an echinococcal cyst), i. e. to closed echinococcectomy.

One of the main stages of the operation directed on recurrence of the disease prevention is intraoperative treatment of the residual cavity. A large number of different methods affecting residual cavity of a cyst by means of hypertonic solution, iodine-containing agents, suspension form of albendazole, glycerin solution, dimexidum solution, ethyl alcohol, formalin was proposed [24; 25]. We practiced chemical treatment of the residual cavity (alcohol 70 % and iodine 5 %), physical methods of treatment (ultrasonic cavitation + decasan). In the postoperative period, prophylactic chemotherapy was used (Zentel, 12 mg per pound of weight in one course).

As it is known, surgical interventions may be applied in conservative (organ-preserving) and radical variants. Conservative interventions are simpler, safer and less time consuming, but have a high level of postoperative complications (6–47 %) and relapses (4–25 %) [26]. Radical interventions are associated with low recurrence rates (0–3 %), high intraoperative risk of complications (0–26 %), and mortality [27]. Radical methods but echinococcectomy include pericystectomy and resection of the liver with a cyst. A newer surgical radical pericystectomy method — subadventical cystectomy — was developed for hydatidosis of liver echinococcosis [28]. With the open method, the contents of the cyst are previously removed, after which the fibrous capsule is excised. This method is

preferred, especially when the walls of the cyst are thin and there is a risk of rupture. At the same time, a portion of the fibrous capsule, closely adjacent to large vascular structures, is left on them, i. e. Subtotal pericystectomy is performed [29].

All patients in the early postoperative period were prescribed anti-relapse treatment, which continued after discharge. Patients received at least 3 consecutive courses with a further invitation to the ultrasound examination every 6 months.

Patients were recommended to be examined every 6 months to detect the recurrence of the disease. To identify and verify relapse, ultrasound scan, chest x-ray, and, if indicated, CT scan and MRI were used. The use of a high-resolution spiral computed tomograph, introduced in our clinic, greatly facilitated the diagnosis and differential diagnosis of combined and multiple echinococcosis.

Findings

1. For the detection of combined and multiple echinococcosis, a thorough comprehensive diagnosis is required, including both an enzyme immunoassay and instrumental examination (ultrasound scan, MSCT or MRI, x-rays).
2. To prevent recurrence of treated disease, strict antiparasitic measures are needed, including careful isolation of the surgical field, complete treatment of the residual cavity with chemical and physical means, as well as postoperative devasting therapy.
3. Patients after echinococectomy is recommended to carry out clinical supervision every six months using non-invasive methods.
4. It is necessary to improve integrated measures combating multiple and combined liver echinococcosis, to improve training of medical personnel and to conduct targeted health education activities among population.

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